# CLAIMS

What is claimed is:

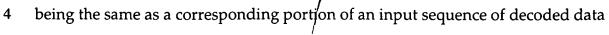1   1.    A method comprising:

2        inserting a delay sequence of data values into an output data sequence of data

3   values, a portion of the output data sequence following the delay sequence being the

4   same as a corresponding portion of an input sequence of decoded data obtained from a

5   speech decoder, the input sequence having at least one distorted non-voice sequence

6   representing a non-voice signal;  and

7        inserting a substantially undistorted non-voice sequence into the output

8   sequence, the undistorted sequence being at least of substantially the same length as the

9   distorted sequence, a portion of the output sequence following the undistorted

10  sequence being the same as a corresponding portion of the input sequence, the output

11  sequence being substantially free of the distorted non-voice sequence.


1   2.    The method of claim 1 wherein the undistorted non-voice sequence comprises a

2   sequence of dual tone multiple frequency (DTMF) signal values.


1   3.    The method of claim 1 wherein the substantially undistorted non-voice sequence

2   comprises a regenerated non-voice sequence that matches the non-voice signal.


1   4.    The method of claim 1 further comprising processing the output sequence to

2   identify the undistorted sequence as representing a DTMF digit.


1   5.    A method comprising:

2        inserting a first delay sequence of data values into an output data sequence of

3   data values, a portion of the output data sequence following the first delay sequence

4   being the same as a corresponding portion of an input sequence of decoded data

5   obtained from a decoder that operates according to a speech coding/decoding process,

6   the input sequence having at least one distorted non-voice sequence representing a non-

7   voice signal;

8           inserting a second delay sequence into the output data sequence in response to

9   determining that the non-voice signal is likely to be in the input sequence, based on

10  values associated with the input sequence and the speech coding/decoding process, a

11  portion of the output data sequence prior to the second delay sequence being the same

12  as a corresponding portion of the input sequence; and

13          inserting a substantially undistorted non-voice sequence into the output

14  sequence following the second delay sequence, the undistorted sequence being at least

15  of substantially the same length as the distorted sequence, a portion of the output

16  sequence following the undistorted sequence being the same as a corresponding portion

17  of the input sequence.


1   6.      The method of claim 5 wherein the undistorted non-voice sequence comprises a

2   sequence of dual tone multiple frequency (DTMF) signal values.


1   7.      The method of claim 5 wherein the undistorted non-voice sequence comprises a

2   regenerated non-voice sequence that matches the non-voice signal.


1   8.      The method of claim 5 wherein the second delay sequence is longer in time than

2   the first delay sequence.


1   9.      The method of claim 5 wherein the values comprise

2           a plurality of linear prediction coding (LPC) parameters received by the decoder

3   and associated with the input sequence.

1   10.    The method of claim 5 further comprising

2         processing the output sequence to identify the undistorted sequence as

3   representing a DTMF digit.


1   11.    An apparatus comprising:

2         buffer having an input to receive a sequence of decoded data having a non-voice

3   signal and speech therein and a first buffer output that provides the decoded data in a

4   first in first out manner;

5         signal processor having an input to receive the decoded data and a processor

6   output that provides a sequence of regenerated data representing a regenerated non-

7   voice signal, the processor generates an A select signal in response to identifying the

8   non-voice signal in the sequence of decoded data; and

9         multiplexer A having a first input coupled to the first buffer output to receive the

10  decoded data, a second input coupled to the processor output to receive the regenerated

11  data, and a multiplexer A output that provides data from the second input in response

12  to the A select signal.


1   12.    The apparatus of claim 11 wherein the non-voice signal comprises a tone signal.


1   13.    The apparatus of claim 11 wherein the regenerated non-voice signal matches the

2   non-voice signal.


1   14.    The apparatus of claim 11 wherein the buffer comprises a first FIFO buffer

2   portion and a second FIFO buffer portion in series therewith that receive the decoded

3   data from the decoder, the apparatus further comprising:

4    predictor that determines whether the non-voice signal is likely to be in the

5    sequence of decoded data based on values associated with the sequence of decoded

6    data and representing characteristics of a speech coding/decoding process used to

7    generate the decoded data; and

8        multiplexer B having a first input coupled to the decoder, a second input coupled

9    to an output of the second buffer portion, and an output coupled to the first input of

10   the multiplexer A, the multiplexer B provides data at its output from its second input in

11   response to the B select signal.


1    15.    A repeater comprising:

2        means for storing an input sequence of decoded data having a non-voice signal

3    and speech therein, in a first in first out manner;

4        means for providing a sequence of regenerated data representing a regenerated

5    non-voice signal matching said non-voice signal;

6        means for providing an output sequence being a delayed version of the input

7    sequence; and

8        means for providing the sequence of regenerated data as part of the output

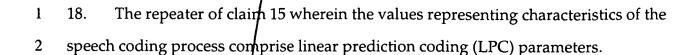9    sequence in response to identifying the non-voice signal in the input sequence.


1    16.    The repeater of claim 15 further comprising:

2        means for inserting a second delay sequence into the output data sequence in

3    response to determining that the non-voice signal is likely to be in the input sequence,

4    based on values associated with the input sequence and the speech coding/decoding

5    process.


1    17.    The repeater of claim 15 wherein the non-voice signal comprises a DTMF signal.

1    18.    The repeater of claim 15 wherein the values representing characteristics of the

2    speech coding process comprise linear prediction coding (LPC) parameters.

1    19.    The repeater of claim 15 further comprising means for decoding a plurality of

2    encoded packets into said sequence of decoded data according to a speech

3    coding/decoding process.

1    20.    An article comprising:

2    a machine-readable medium having instructions which when executed by a

3    processor provide a sequence of regenerated data representing a regenerated non-voice

4    signal that replaces a distorted non-voice signal in a sequence of decoded data from a

5    speech decoder.

1    21.    A method comprising:

2    detecting a non-voice signal in a sequence of decoded data; and

3    replacing distorted non-voice data in the sequence with regenerated non-voice

4    data representing the non-voice signal.

1    22.    The method of claim 21 further comprising after replacing the distorted non-

2    voice data:

3    detecting the non-voice signal in the sequence based on the regenerated data.

1    23.    The method of claim 21 wherein the non-voice signal is a DTMF signal.